FEBRUARY, 1919.

# ENTOMOLOGICAL NEWS

Vol. XXX. No. 2.

Thaddeus William Harris
1795-1856.

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

---

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

---

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

# ENTOMOLOGICAL NEWS

published monthly, **excepting August and September**, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

**ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.**

**SINGLE COPIES 24 CENTS.**

**ADVERTISING RATES: Full width of page. Payments in advance.**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| One issue, | one inch, | $ 1.20, | two inches, | $ 2.40, | half page, | $ 4.00, | full page, | $ 8.00 |
| Five issues, | " | 5.50, | " | 11.00, | " | 17.50, | " | 35.00 |
| Ten issues | " | 11.00, | " | 20.00, | " | 35.00, | " | 70.00 |

☞All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

## SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

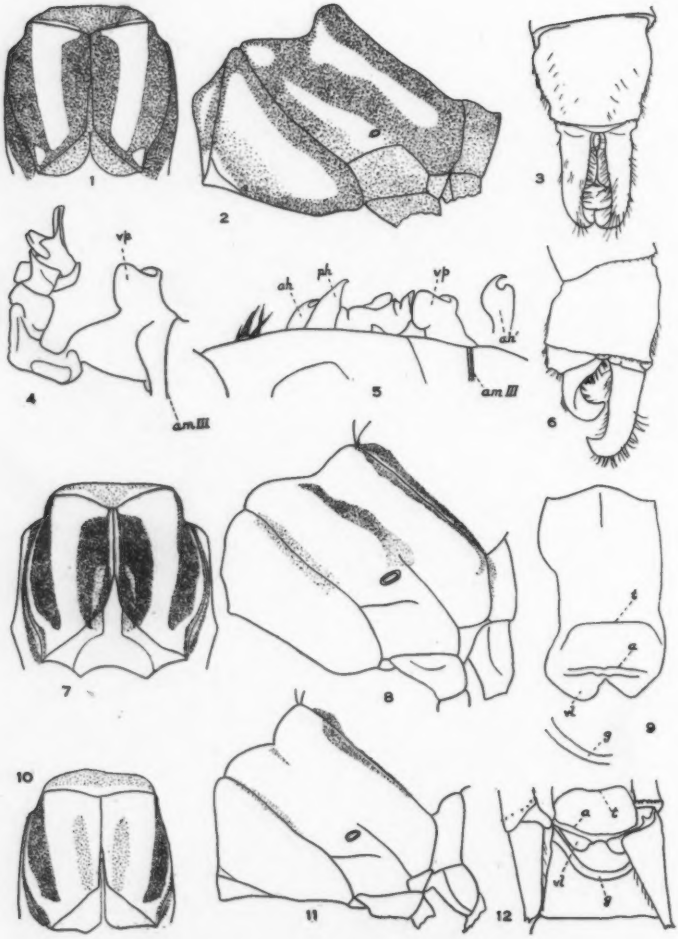
☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.



**500 PIN-LABELS, 25 CENTS! All Alike on a Strip.**

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line)
Additional characters 1c. each, per Line, per 500, Trimmed.

**C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.**




ODONATA ANISOPTERA FROM GUATEMALA.—CALVERT.

1-6, ERPETOGOMPHUS SCHAUSI; 7-9, E. DIADOPHIS, PARATYPE; 10-12, E. DIADOPHIS?, CAYUGA ♀.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. FEBRUARY, 1919. NO. 2.


CONTENTS:


Calvert—Odonata Anisoptera from Guatemala..... 31
Stoner—Swarming of the Monarch Butterfly in Iowa (Lep.)..... 38
Wilson and Davis—A New Genus and Species of Aphid (Hem., Hom.)... 39
Cockerell—Neocorynura, a Genus of Halictine Bees (Hym.)..... 41
Crampton—Notes on the Phylogeny of the Orthoptera..... 42
Skinner—A few hours on Mt. Washington (Lepid.)..... 48
Editorial—Entomology at the Convocation Week Meetings..... 49
Entomological Literature..... 50
Review of Prof. Carlos E. Porter's Collector's Manual in Spanish..... 53
Review—Washburn's Injurious Insects and Useful Birds..... 54
Review—Rau's Wasp Studies Afield.. 54
Doings of Societies—Ent. Sec., Acad. Nat. Sci. of Phila..... 56
American Entomological Society.. 56
Feldman Collecting Social..... 58
Obituary—Victor Arthur Erich Daecke 58


## Odonata Anisoptera from Guatemala

**Collected by Messrs. William Schaus and John T. Barnes.**


By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.


(Plate III)

Messrs. Schaus and Barnes, whose extensive collecting of Lepidoptera in Guiana, Mexico and Costa Rica is well known, turned their energies to Guatemala in February, 1915, remaining in that country until April, 1918. During that period they sent to me from time to time a number of Odonata which add to our knowledge of the fauna of Guatemala over and above that recorded in the Neuroptera volume of the *Biologia Centrali-Americana*. I have listed them, following the order of the species in the Biologia and occasionally adding some descriptive matter. Mr. Schaus made some notes on the fresh colors of some of the specimens and these I have enclosed in quotation marks. He has also given me data on some of the more unfamiliar localities at which they took Odonata, as follows:

*Caballo Blanco*, "13 miles beyond Retalhuleu on the branch line to Champerico: it consists of grazing country with a little vegetation along the rivers, but no forest near at hand, and the soil is humid and very fertile."

*Cayuga*, 23.4 miles from Puerto Barrios and a little west of Tenedores. A farm house recently abandoned was fitted up by the United Fruit Company and placed at their disposal; it was their Guatemalan headquarters. "The house stands on a hill by itself, 150 feet above the railway and river, with the most glorious views in every direction. The chief veranda faces the south with the winding [Motagua] river threading through thousands of acres of bananas, limited by virgin forests, and with the mountains of Honduras in the distance; to the north we are close to forest clad hills and almost all my day collecting is along [their] trails and streams. The elevation of the [railway] station is 107 feet and the forest ridge about 400 feet higher. The hills....on the south side are covered with dense tropical forest, no pines at all." On October 7, 1915, he wrote: "I cannot understand why with the heat and rain there are not more things flying." On April 30, 1917: "The conditions here (climatic) are still disastrous and not an insect is to be seen except a few wasps. Not a drop of rain has fallen since I last wrote and all the weeds around the place are dead and dried up and there are extensive forest fires, fanned into energy by strong easterly gales which blow all afternoon and evening.'

*Chejel*, in Baja Vera Paz, eleven miles from Tucurú, elevation 3100 feet. "I have had five weeks at Chejel, where I have been visiting most charming friends" [in June, etc., 1917].

*Iguana*, "a flag station, 72.3 miles from Barrios, elevation 493 feet, and at the beginning of the dry section of the Motagua valley; the country is hilly, with scattered pines and swampy in places. We only went there once for a few hours and found your Odonata flying in the wet places."

*Joaquina*, "a flag station, 170 miles from Barrios, elevation 2269 feet; a dry district owing to steep mountains with muddy ditches along track in rainy season, little vegetation and some 200 feet above river. We were delayed there several hours by a land-slide, so I put my net on and caught a few insects."

*Montufar*, "44 miles from Barrios (Motagua valley)."

*Oneida*, "Motagua valley near Morales, 25 miles from Barrios, elevation 300 feet."

*Polochic River*. Writing Aug. 17, 1917: "I am still in Vera Paz..... since a week I have worked every night with my lamp until 3 A. M. Barnes is doing the day work and rides nine miles down the mountains to the Polochic River and gets in several hours' collecting."

*Purulhá* "is the correct spelling, not Purula, as Champion spells it."

In the letter just quoted: "I have had.....three weeks at Purulhá."

*Quirigua* "is 57.4 miles from Barrios, elevation 240 feet, and is in the humid banana district. The Motagua valley is very broad there, with hills on the south side covered with forest of poor growth, chiefly pines and the manaca palms; there are small streams in all the valleys. The forest in the main valley has all been cleared by the Fruit Co." In their first year in Guatemala they had a month or six weeks at Quirigua before going to Cayuga.

*San Felipe*, "in the department of Retalhuleu, elevation 2056 feet, surrounded by sugar cane and coffee plantations."

*Santa Maria*, Volcano, department of Quezaltenango, elevation 5500 feet.

*Tactic*, Baja Vera Paz; "ten days in Tactic" (Aug. 17, 1917).

GOMPHINAE.

**Gomphoides elongata** Selys. Gualan, August, 1 ♂.

Very close to the only male of *elongata* which is available for comparison, viz., from Guadalajara, Jalisco, Mexico, July, by Schumann, listed in the Biologia volume, page 157. This Gualan male is smaller (abdomen 43.5, hind wing 31 mm.), less robust, the lateral margins of abdominal segments 8 and 9 are less dilated, that of 9 less angulate, angle distinctly rounded, superior anteapical angulation of the superior appendages also rounded.

**Gomphoides suasa suasa** Selys. Cayuga, May, 1917, 1 ♂. Quirigua, forest, June 25, 1 ♂, 1 ♀.

**Erpetogomphus schausi** n. sp. (Pl. III, figs. 1-6).

Purulhá, forest stream, July 7, 1 ♂, *type*, in the writer's collection at the Academy of Natural Sciences of Philadelphia.

♂. Black or blackish brown, the following bright green: greater part of the frons (except its postero-dorsal and antero-ventral margins), the rhinarium, a transverse streak on the middle of the free margin of the labrum, the greater (anterior) part of the fore prothoracic lobe, anterior margin of the propleuron, the greater part of the transverse dorsal mesothoracic ridge (but not where it joins the mid-dorsal carina or the humeral suture), an antehumeral stripe separating the dark submedian and antehumeral stripes, increasing in width cephalad and ventrad and confluent with the green of the transverse mesothoracic ridge just mentioned (at mid-height this green antehumeral stripe is a little wider than half of the dark submedian and narrower than the dark antehumeral stripe), a rounded triangular spot just below the antealar sinus and anterior to the humeral suture,

almost confluent with the upper end of the green antehumeral stripe (this spot apparently represents the upper end of an otherwise obsolete pale humeral stripe), a mesepimeral stripe wider above, a rounded superior spot and an inferior stripe on the metepisternum, a wider stripe on the metepimeron (each of these three sclerites being margined with black on all sides, but the postero-ventral angle of the metepimeron is green), and the dorsal interalar sclerites. (Pl. III, figs. 1, 2.)

Mandibles, maxillae and labium buff, but the apices of the first two and of the median and lateral labial lobes black.

Ventral thoracic surface dull greenish with pruinose traces in the depressions.

Abdomen blackish-brown, its pale markings evidently faded, such as are visible being the sides of 1 inferiorly, the auricles, a postero-ventral spot and possibly a mid-dorsal stripe on 2, a mid-dorsal basal stripe or spot of indeterminable extent on 3-6, a basal lateral spot on the same four segments, the basal half of 7, a large (reddish) spot on each side of 10.

Femora reddish-brown, blackening distally, fore pair pale greenish inferiorly. Tibiae and tarsi wholly black.

Occiput non-tuberculate, its hind margin moderately convex.

Abdomen narrowing from segment 1 (2.6 mm.) to the middle of 3 (.8 mm.), thence widening very gradually to apex of 6 (1.4 mm.), thence widening rapidly to the apex of 8 (2.6 mm.), thence narrowing to the apex of 10 (1.9 mm.).

Superior appendages (Pl. III, figs. 3, 6) 1.96 mm. long, slightly longer than 10, subequal to 9; in dorsal view, their external margins straight and parallel for two-thirds' length of the appendage, each appendage constricted at its extreme base, following which, on the internal side, it is swollen for its first third, then gradually narrows, the terminal third of the appendage strongly curved mesad forming a blunt hook; in profile view, the superior margin is almost straight for two-thirds of the length of the appendage, the inferior margin subparallel, but swollen a little at two-fifths of the same length, no superior or inferior teeth or tubercles, the terminal third of the appendage curved strongly ventrad to an acute apex; superior appendages yellow, brown at apex.

Inferior appendage blackish-brown, stout, two-thirds as long as the superiors; in profile view, its superior margin concave throughout except for the first fifth of the appendage's length, which is straight, slanting caudad and ventrad, and forms an obtuse angulation where the concave curve begins, terminal half of the appendage curved strongly dorsad and slightly cephalad; in ventral view, the appendage is bifid for its entire visible extent *i. e.*, its distal two-thirds, the proximal third being concealed by the sub-anal plates), the two branches in

contact with each other, their external margins slightly converging, their apices roundedly truncate from within laterad.

Genitalia of abd. seg. 2: (Pl. III, figs. 4, 5). Anterior lamina brown, low, entire, with a marginal row of brownish hairs; the other genitalia darker. Anterior hamules bifid at tip, internal branch the longer and more acute, interval separating it from external branch elliptical, narrower at the mouth. Posterior hamules one-and-two-fifths times as long as the anterior hamules, tapering to an acute apex. Vesicle of the penis projecting subequally with the anterior hamules, having on each side a stout antero-ventral angle of somewhat less than 90 degrees. Posterior margin of each auricle almost straight, slightly convex, bearing 5-6 denticles.

Wings barely smoky yellowish. Stigma dark reddish-brown within black veins, surmounting 5-6 cells. Venation, including the costa, black. Forewings with 20 (r), 18 (l) antenodals, the 7th (r) or 6th (l) thicker, 14 (r), 15 (l) postnodals, two posttriangular rows increasing near the level of the nodus with 7-8 marginal cells, a maximum of three rows of cells in the second cubital area. Hind wings with 13 (r), 14 (l) antenodals, the 6th thicker, 13 (r), 14 (l) postnodals, 3 posttriangular cells, then two rows, increasing near the level of separation of Rs bridge from M1+2, with 13-14 marginal cells, proximal row of postanal cells 5, distal row of 4, a maximum of five rows of cells in the second cubital area, anal triangle 4-celled.

Abdomen 33, hind wing 30, costal edge of stigma of fore wing 3.5 mm.

Only the type male has been seen. This handsomely colored species falls near *E. eutainia* and *E. viperinus* in the synopsis of species of *Erpetogomphus* in the Biologia volume, pages 159-160. It differs from *E. eutainia* in the absence of an inferior longitudinal carina on the basal third of the superior appendages, in the strongly ventral curvature of the terminal third of the same appendages and in the shape of their apices, the apparent absence of a second pale antehumeral stripe separating the dark antehumeral and humeral stripes, and of a yellow line on the costa anteriorly, the greater number of ante- and postnodals and the longer wings.

From *E. viperinus*, *E. schausi* differs by the presence of dark markings on the face, the stronger ventral curvature of the terminal third of the superior appendages, the apparent absence of a second pale antehumeral stripe the greater number of ante- and postnodals, etc.

**Erpetogomphus diadophis** ? Calvert (Plate III, figs. 10-12). Cayuga, house, October 25, 1 ♀. Very similar to the paratype of the species (in coll. Acad. Nat. Sci., Philadelphia) in the shape of the occiput, the very reduced vulvar lamina and the characteristic semicircular groove on the sternum of 9. It is smaller (abdomen 29, hind wing 24, costal edge of stigma, front wing 3 mm.) and the annulate appearance of the abdomen, on 3-7, due to the presence of a transverse median yellow band in *diadophis*, is on first examination not distinct, owing, perhaps, to the apparently less matured coloration of the body generally. I believe that I can recognize the annuli on segments 6 and 7, at least. Color differences, due, possibly, to the same cause (immaturity), are the smaller extent of the dark paramedian stripes of the thorax (mesepisternum) and of those at the humeral, at the obsolete first lateral and at the second lateral sutures, in comparison with those of the paratype of *diadophis*, as our figures show. (Pl. III, figs. 10 and 11, 7 and 8).

The similarity of the vulvar laminae in the two specimens is not identity. The two lobes of the lamina in the Cayuga female are relatively more widely separated than in the paratype (*cf.* Pl. III, figs. 12, 9), although the absolute measurements are as follows: from apex of right lobe to apex of left lobe, Cayuga ♀ .3 mm., *diadophis* ♀ paratype .4 mm.; length of lobes measured from the anterior (*a*) of the two transverse lines shown in Pl. III, figs. 12, 9: Cayuga ♀ .2 mm., ♀ paratype .3 mm.

In addition to the possession by both females of the semicircular groove on the ventral side of segment 9, mentioned above and shown in our figures quoted, both females show a transverse groove (*t*) on the sternum of 8, anterior to the vulvar lamina, and situated in both at three-fourths the length of the sternite, measuring from its anterior extremity to the same line *a*.

Neither the paratype of *diadophis* nor the female from Cayuga is in perfect condition; the former, ever since I received it from the late Mr. McLachlan, has lacked segment 10 and the abdominal appendages. Without additional material it is not possible to decide whether these two females are conspecific or not. All that I am able to say at present is that they appear to be very near to each other on the basis of structural characters, while differing in size and in details of coloring.

**Epigomphus subobtusus** Selys. Cayuga, dark forest, April 25, 1 ♀; forest, May 3, 1 teneral ♀; forest, 1 ♂ over stream, 1 teneral ♀; stream in dark forest, May 28, 1 ♂, "oblique black and greenish blue

streaks on thorax. Abdomen black with fine yellow segmental lines; a broak yellow mark before end" [*i. e.* on segment 7].

CORDULEGASTERINAE.

**Cordulegaster godmani** McLachlan. Purulhá, forest, July 10, 1 ♂ 1 ♀ "in cop."

AESHNINAE.

**Anax amazili** (Burmeister). Cayuga, June 2, stormy night, at light, 1 ♀; August 24, at light, 1 ♀.

In the key to the species of *Anax* in the Biologia volume, page 176, I stated for *amazili* "Superior frontal marking a triangular black spot, no dark ring," by way of contrast with *junius* and *walsinghami*. In well-colored individuals there is on each side, right and left, of the triangular black spot and separated from it by a yellow line, a triangular blue spot, as Hagen (1861, 1867), Brauer (1866) and Martin (1908) have stated. Occasionally these two blue spots are not visible, as in a Costa Rican female before me; in other cases, as in the Cayuga female of June 2, the blue has become a dark brown, although the two spots are not united anteriorly and hence form no ring as in *junius* and *walsinghami*. Still my statement of 1905, quoted above, is incomplete and hence a little confusing. It may be bettered by inserting after "a triangular black spot:" "usually with a separate triangular blue (sometimes brown) spot to right and left."

The capture of these two females *at light* is interesting.

**Aeshna cornigera** Brauer. Chejel, June 26, 1 ♂, "almost entirely black; some pale greenish markings on thorax laterally." Purulhá, forest, July 10, 1 ♂, "frons and base of abd. turquoise blue. Broad green lateral oblique stripes on thorax. Fine broken green transverse lines on abd." Antigua, 5500 feet, November 24, 1 ♂, 1 ♀. Volcan Santa Maria, November, 1 ♂.

**Aeshna multicolor jalapensis** (Williamson). Santa Maria, 5500 feet, June 13, 1 ♂. Volcan Santa Maria, October 31, 1 ♀.

**Aeshna virens** Rambur. Cayuga, on veranda, September 5, 1 ♀.

**Gynacantha trifida** Rambur. Cayuga, at dusk, April, 1 ♀; forest, August 23, 1 ♀, and 27, 1 ♂.

**Gynacantha septima** Selys. Cayuga, at dusk, April, 1 ♂; forest, September 16, 1 ♀. The male has the anal triangle 3-celled.

**Gynacantha mexicana** Selys. Cayuga, at dusk, June 3, 1917, 1 ♂.

**Gynacantha tibiata** Karsch. Cayuga, forest, August 30, 1 ♀.

**Gynacantha gracilis** Burmeister. Cayuga, forest, September 4, 1 ♀. This is the most northern locality for this species yet recorded; I have taken it also in Costa Rica, in the Banana River country.*

EXPLANATION OF PLATE III.

Figs. 1-6, *Erpetogomphus schausi* n. sp., type ♂, Purulhá, Guatemala, July 7. Figs. 1, Dorsal, and 2, Right lateral views of the meso-metathorax showing the color pattern. x 6.6. Figs. 3, Dorsal, and 6, Left lateral, views of the apex of the abdomen. x 7. Fig. 4, Right lateral view of penis and vesicle removed from the other genitalia of the second abdominal segment, inverted. Fig. 5, Right lateral view of genitalia of the second abdominal segment, inverted, penis lying between the hamules of the right and left sides; *ah*, anterior, and *ph*, posterior, hamules; *vp*, vesicles of the penis, *ah'*, anterior hamule viewed antero-laterally to show form of apex; *am III*, anterior margin of abdominal segment 3. Figs. 4-5 x 14.3.

Figs. 7-9, *Erpetogomphus diadophis* Calvert, ♀ paratype, Texas. Figs. 7, Dorsal, and 8, Right lateral views of meso-metathorax showing the color pattern. x 6. Fig. 9, Sternite of abdominal segment 8 and part of groove (*g*) on sternite of segment 9. x 12.

Figs. 10-12, *Erpetogomphus diadophis* ? ♀ Cayuga, Guatemala, Oct. 25. Figs. 10, Dorsal, and 11, Right lateral views of meso-metathorax showing the color pattern. x 6.5. Fig. 12, posterior part of abdominal segment 8 and all of segment 9, ventral view. x 12.75.

In figs. 9 and 12: *a*, anterior of the two transverse impressions, and *t*, transverse groove, cephalad of the vulvar lamina (*vl*) (see page 36); *g*, semicircular groove on sternite of 9.

All these figures are based on camera lucida drawings, using a Zeiss compound microscope with objective A (its lower lens off), and ocular 2 (figs. 4, 5, 9 and 12), or compensating ocular 2 (the remaining figures).

(To be continued)

**Swarming of the Monarch Butterfly in Iowa (Lep.).**

While driving along a country road three miles northwest of Vinton, Iowa, on Sept. 8, 1918, a swarm of Monarch butterflies (*Anosia plexippus* Linn.) attracted my attention. The immediate region is hilly, once wooded, but now only small white oak groves scattered here and there remind one of that fact. At least several hundred butterflies were in this swarm, which, at the time of my observation, did not seem to be moving in any particular direction. Some of the individuals were flying about rather aimlessly a few feet above the ground, while others had alighted on the leaves and branches of the white oak trees. The observation was made at 6.10 P. M., and it is probable that the insects were preparing to settle for the night. The weather was partly cloudy and there was little or no breeze.—DAYTON STONER, State University of Iowa, Iowa City, Iowa.

* Calvert, A. S. & P. P. A Year of Costa Rican Natural History, New York (Macmillan), pp. 315-318. 1917.

# A New Genus and Species of Aphid (Hem., Hom.).

By H. F. Wilson, University of Wisconsin, Madison, Wisconsin, and J. J. Davis, U. S. Bureau of Entomology, W. Lafayette, Indiana.

Descriptions made from specimens collected on choke cherry (*Prunus serotina*) at Portage and Madison, Wisconsin, during June and July, 1916 and 1918, respectively. Found in colonies at the tips of the twigs where the forms were noticed in early June but no alate specimens could be found until July 6. The sexual forms were also collected on *Prunus*, September 8, 1912, at Prairie du Chien, Wisconsin. This species is quite distinct from other species found on *Prunus* spp. because of missing nectaries, although all the other characters are typical of the genus *Aphis*.

**ASIPHONAPHIS** new genus.

Antennae with six segments and wing venation and cauda as in *Aphis*. The character which makes it distinct from *Aphis* is the lack of visible nectaries. The male as well as the oviparous female is apterous.

*Type*: *Asiphonaphis pruni* n. sp.

**Asiphonaphis pruni** new species.

*Apterous viviparous female.*—General color whitish green with bands of dark green, extending across the abdomen. There are about eight distinct bands on the abdomen and two more or less indistinct marks between the thoracic segments. The bands on the abdomen are enlarged in the middle and at both ends. The enlarged areas in the center are angular, while those on the ends are rounded. In the center of each end spot a light spot can be seen which is the opening to the spiracle. In the older individuals the central group of spots are more or less confluent and form a longitudinal stripe extending the length of the abdomen. The last three cross bands show a series of white spots regularly placed either four or six in the first band and four in last.

Antennae light at the base and dusky to black at the tip. Legs, except the knees and tarsi, light colored. Antennae with six segments, the spur of the sixth being slightly longer than the third. The apterous forms producing the sexes in the fall usually have the third and fourth antennal segments coalesced.

Prothorax with a large broad tubercle on each side and abdomen with a series of smaller tubercles along each side.

Cauda curved upward and knobbed at the tip.

*Measurements.*—Length of body 2.5 mm. Length of antennal segments, III, 0.35 mm.; IV, 0.25 mm.; V, 0.25 mm.; VI, base, 0.166 mm.; spur, 0.46 mm.

*Alate viviparous female.*—General color of antennae, head and thorax, black. Abdomen light green, with darker green bands as in the apterous female. Antennae and legs dusky to black except the base of the antennae and the basal two-thirds of the tibiae.

Third antennal segment with numerous round sensoria of irregular size and with a thick edge. Fourth segment with three to six or more similar sensoria and fifth with none to two or three small ones besides the usual large sensorium near the distal end.

Prothorax with a large wide tubercle on each side and a series of unusually conspicuous tubercles and hairs along each side of the abdomen.

Wings with two cubital veins and the median vein with two forks the terminal branch about one-third the distance from the tip to point where the first branches. In several individuals at hand the second cubital vein is also forked close to the edge of the wing. In the hind wing it is not uncommon to find the median vein branched near its base. The wing veins conspicuously brown.

*Measurements.*—Length of body, 2 mm. Length of antennal segments, III, 0.41 mm.; IV, 0.31 mm.; V, 0.27 mm.; VI, base, 0.18 mm.; spur, 0.52 mm.

*Apterous male.*—Only apterous observed. Head blackish, thorax dusky and abdomen yellowish and slightly dusky with three paler longitudinal areas. Antennae black, legs dusky, cornicles and cauda concolorous with abdomen.

The spur of the sixth antennal segment nearly twice as long as the third; small sensoria on all, excepting the two basal segments, irregularly placed and in numbers as follows: Third segment with none to six, fourth with 8 to 19, fifth with 14 to 17, not including the usual distal one, and base of segment six with none to 2, not including the usual group at apex. Body bearing conspicuous tubercles along each side as in other forms.

*Measurements.*—Length of body, 1.25 mm.; width, 0.51 mm. Length of antennal segments, III, 0.19 mm.; IV, 0.14 mm.; V, 0.16 mm.; VI, base, 0.09 mm.; spur, 0.35 mm.

Cotypes in the collection of the U. S. National Museum and the authors' collection.

## Neocorynura, a Genus of Halictine Bees (Hym.).

By T. D. A. COCKERELL, Boulder, Colorado.

Schrottky proposed the name *Neocorynura* for *Cacosoma* F. Smith, preoccupied. The species are very numerous in Peru, and adjacent parts of Bolivia and Brazil; but they also extend as far north as Mexico, and the following form is to be added to that fauna:

**Neocorynura discolor knabiana** subsp. n.

♀.—Length about 8 mm., anterior wing 6.7 (true *discolor* 9 mm., wing 7.5 mm.); first abdominal segment reddish-black, brilliant green at sides and base; second segment with laterobasal corners bright green; third with a green basal band, covered with white tomentum. Antennae red at apex.

Cordoba, Vera Cruz, Mexico, January 20, 1908 (*F. Knab*), U. S. Nat. Museum.

Differs from typical *N. discolor*, as described by Smith, and again (from four examples collected by Sallé) by Vachal. in the green base of abdomen. The wings are greyish, with the marginal cell and beyond broadly fuliginous. This is also very near *N. chlorocion* (Vachal), but is easily separated by the black face. It is also related to *N. lignys* (Vachal), which Mr. Knab took at Cordoba on the same day.

The following key separates this from a series of Mexican and Central American specimens now before me, and records some new localities:

Abdomen elongated, distinctly claviform, segments 2 and 3 green at base; males. (Cordova, Mexico, May 10, *L. O. Howard*)*, *N. chlorocion* (Vachal)

Abdomen ordinary, or scarcely elongated; females.....1

1. First abdominal segment with very large coarse punctures; marginal cell and beyond fuscous (Tabernilla, Canal Zone, Panama, July, 1907, *Aug. Busck*) .....*N. cuprifrons* (F. Smith)

First abdominal segment not thus punctured.....2

2. Smaller; area of metathorax brilliant pale green, *N. discolor knabiana* Ckll.

Larger; area of metathorax not thus green...*N. lignys* (Vachal)

* One of the *N. chlorocion* males carries two stylopids; this adds a genus to the list of those parasitized by Stylopids. The *N. chlorocion* have the wings appreciably dusky and the second abdominal segment quite closely punctured, but they are surely this species, which was originally recorded from Orizaba.

Probably one of these is *Rhopalictus chalcozonia* Sichel, of which Sichel said that he had a series from Mexico, but lacked time and space to describe it. Such time and space were never found, so far as I can discover, and the name remains nude. *Halictus konowi* Ducke is the same as *N. cuprifrons*, as Ducke himself stated. Smith, for no valid reason, described the insect as a *Megalopta*, so Ducke's mistake is not surprising. I have examined Smith's type.

From Chanchamayo, Peru (*Rosenberg*), the U. S. Nat. Museum has specimens of *N. lampter* (Vachal) and *N. lepidodes* (Vachal). The latter was described from Bolivia, and is new to Peru. I have one from Mapiri, Bolivia, sent by Schrottky.

## Notes on the Phylogeny of the Orthoptera.*

By G. C. CRAMPTON, Ph.D.

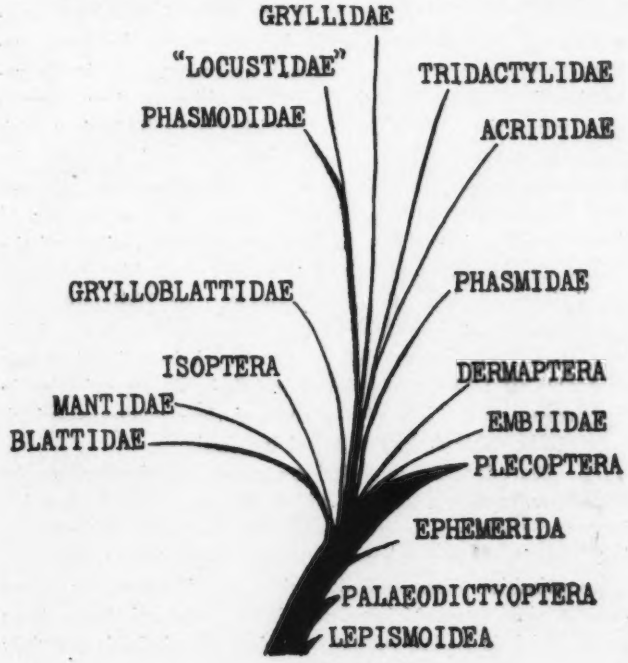
Practically all of those investigators who have recently discussed the phylogeny of the Orthoptera, agree in deriving them from Blattid-like ancestors. In a number of papers dealing with a phylogenetic study of various structural features in insects related to the Orthoptera, I have maintained that the Plecoptera rather than the Blattidae are more like the ancestral stock from which all of these forms are descended, and I would briefly summarize the reason for so thinking in the following discussion.

The appended diagram is offered to aid in visualizing the relationships of the different lines of descent here discussed; but it should be borne in mind that such a diagram should be represented in three dimensions rather than in one plane, if the real relationships of the different groups are to be correctly portrayed. Thus the three lines of descent depicted as though clustering about the Blattids should be represented as though springing off from the main stem at right angles to the plane of the other groups, since these larger groups approach one another from different angles, and the same holds true for the various branches within a larger group; but the diagram as given will serve for all practical purposes.

The "Lepismoid" insects such as *Lepisma, Nicoletia,* etc., (with which such forms as *Machilis* might be likewise includ-

*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

ed, although not belonging to the same order) are anatomically intermediate between the other Apterygota and the Pterygota, and are therefore placed at the base of the stem. The fossil Palaeodictyoptera seem to be very near the first winged insects to be evolved, and are therefore placed a little above the Lepismoid forms in the diagram. The Ephemerida are very closely connected with the Palaeodictyoptera, and also exhibit undoubted affinities with the Plecoptera, so that it is extremely difficult to determine whether to group them with the Palaeodictyoptera, or with the Plecoptera—or even in a distinct group to which the strongly aberrant order Odonata should be added. The Ephemerida are placed a little above the Palaeodictyoptera, since they are among the most primitive living winged insects known, (although in some features



they have become rather highly specialized), and it is to the living forms that the following discussion is largely limited.

The Plecoptera appear to be a "synthetic" group combining in themselves a number of features which are carried over into the other lines of development by the more primitive representatives of each group. The Lepismid-like head, the primitive wings, thoracic sclerites and appendages (even the trimerous tarsi may prove to be more primitive than the pentamerous type) and the nature of the abdominal region with its appendages, not to mention the primitive condition of the nervous system, alimentary tract, and other internal structures, all point to the fact that the Plecoptera have departed as little as any living forms from the probable ancestral condition of the forebears of the higher groups, and the palaeontological record is in full accord with this view. As is indicated in the diagram, the Embiidae are extremely closely related to the Plecoptera, and the Dermaptera are closely related to both Embiids and Plecoptera, although they seem to have somewhat more in common with the Embiids than with the Plecoptera. These three orders, together with the Coleoptera, constitute the superorder **Panplecoptera.** Certain Palaeodictyoptera such as *Stenodictya* exhibit a number of features which have been retained by certain members of the superorder Panplecoptera, and it is quite possible that some fossil forms such as the Haplopteroidea or Hadentomoidea might be included in this superorder also; but too little is known of the structural details of most of these fossil insects to enable us to definitely determine their closest affinities in the present state of our knowledge of their anatomy—which seems to be confined largely to wing-veins!

The Blattidae are regarded by most investigators as the lowest living representatives of the group to which they belong, and their type is undoubtedly an extremely ancient one; but I am by no means certain that the Blattidae are so much more primitive (anatomically) than the Isoptera, as some palaeontologists would have us believe. The opisthognathous head, which is typical of the Blattids as a whole, is certainly

of a higher type than the more prognathous one found in many Isoptera, and the great extent of the compound eyes upward toward the top of the head, which occurs in so many Blattids should also be regarded as a more highly specialized condition. The thickening of the fore wings to form tegmina indicates another specialized condition in the Blattids, as does the extremely flattened condition of the body developed in connection with their hiding habits. The asymmetrical development of the genitalia of the males and the asymmetry of the cerci (in regard to the number of segments composing them) and other similar features would indicate that the Blattids are somewhat more modified than the Isoptera in some respects; although in others, the Blattids are much more primitive than the Isoptera. The Isoptera have preserved a number of features occurring in the more primitive members of the group to which the Plecoptera belong, such as the nature of the thoracic sclerites, etc., which suggest that the Isoptera are even closer than the Blattids are, to the very primitive Plecopteroid group; so that if we are to regard the Plecoptera as the nearest living representatives of the ancestors of the other groups under discussion, it might be argued that the Isoptera are near the ancestral type connecting the Blattoid group with the Plecopteroid group. I am as yet unwilling to go to this extreme, however, since I regard the lower Blattids as more primitive than the lower Isoptera, taking their anatomy as a whole. The fossil Protoblattoidea as reconstructed by Handlirsch certainly show a marked resemblance to certain members of the group to which the Plecoptera belong, as well as to the Palaeodictyoptera, and it is quite probable that these Protoblattoidea more nearly represent the ancestral type leading back to the Plecoptera-like forebears than the Isoptera do, particularly since the Isoptera are quite highly specialized in regard to many features in which the Blattids are decidedly primitive.

The Blattids and Mantids are extremely closely related, and their lines of development soon merge in a common stock when traced back toward their point of origin. Handlirsch would

derive the Mantids from Protoblattoid ancestors, and if this be correct, it is very probable that the Blattids also are descended from the same type of ancestor, and the Protoblattoids might be regarded as the forms connecting the Blattids and Mantids with the ancestral Plecopteroid stock. The Isopteron line of development does not follow that of the Blattids quite as closely as the Mantids do, and I am not certain whether the Isoptera branched off from the common Blattid-Mantid stock at a point near the origin of this common stock, or somewhere further along its path of development. There is some reason for considering that the Isopteron line arose rather near the base of this common stock, however, and I would consider that the lack of fossil remains of Isoptera in the earlier strata is again due to the incompleteness of the palaeontological record rather than to the fact that the Isoptera supposedly did not arise until a much later geological period than the Blattids, as Handlirsch would maintain. At any rate, the Isoptera have retained some very primitive characters which occur among the lower representatives of the Plecopteroid group, and their early or late geological appearance cannot alter this fact; so that the study of the ancestral features occurring in the Isoptera and Mantids is extremely instructive for a phylogenetic comparison with the structures of the Dermapteron and Embiid representatives of the Plecopteroid group, with which they have a surprisingly large number of features in common. The Isoptera, Mantidae and Blattidae have been grouped in the superorder *Panisoptera* and it is possible that the fossil Protoblattoidea belong in this superorder also; but I would not group the Corrodentia, Mallophaga and Siphunculata with them, as Handlirsch seems to do. The Corrodentia with the Neuroptera appear to be an offshoot of the Plecopteroid stock leading toward the Hemipteron line of development, and as has been pointed out in several papers, the Corrodentia, Mallophaga, Siphunculata (Anoplura), Thysanoptera, Hemiptera and their allies constitute the superorder *Panhomoptera* whose line of development parallels remarkably closely that of the superorder *Panneuroptera* (composed of the Neuroptera, Mecoptera, Diptera, Siphonaptera, Hymen-

optera, Trichoptera, Lepidoptera, and such fossil forms as the Protomecoptera, etc.). The relationships of these other forms, however, have no bearing on the ancestry of the Orthoptera, and need not be further considered here.

In making a study of the ancestry of the Orthopteroid insects, the condition found in such primitive representatives of the group as the Grylloblattids and Phasmids is fully as instructive as the study of the fossil Orthoptera thus far described, since these fossil forms appear to be in many respects even more highly modified than the Grylloblattids, etc., and one can make out practically nothing of their anatomical details from figures of them, due no doubt to their poor state of preservation, yet in most cases it is just these structural details which give us the clue to relationships and greatly simplify an otherwise extremely difficult study. On this account I have given more attention to the study of the interesting little insect *Grylloblatta campodeiformis* (described by Dr. E. M. Walker) which is so to speak a "living fossil" having preserved many features occurring in the more primitive representatives of the other lower groups of insects, and which appears to have departed as little as any known form from the probable ancestral condition of the Orthoptera as a whole. No one insect, however, has retained all of the ancestral features, and the study of such primitive Phasmids as the interesting little insect *Timema californica* Scudder is no less important, since it has preserved certain features which even *Grylloblatta* has lost. Unfortunately both of these insects are wingless; but I do not consider this a great handicap in such a study, since I cannot help thinking that too great weight has been placed upon a phylogenetic study of the wing veins alone, and anyone who will go into the matter at all deeply will soon become convinced that it is only through an examination of a widely different series of structures from as many parts of the body as possible, that we can come to an approximately correct conclusion in the matter of determining the relationships of the different orders of insects, so that it may perhaps be a good idea to give the already overworked wing-venation a rest, and take up the consideration of some other features as well.

Dr. Walker (Canadian Entomologist, Vol. xlvi, page 93), has maintained that the line of development of *Grylloblatta* should be traced back to the Blattids as the nearest living representative of the ancestors from which the Grylloblattids were derived, while I have contended that although *Grylloblatta* exhibits undoubted affinities with such Blattoid insects as the Mantidae (and Isoptera also), the Embiids and Dermaptera more nearly represent the ancestral stock from which the Grylloblattids were descended.*

(To be continued.)

### A Few Hours on Mt. Washington (Lepid.).

On July 31, 1918, I ascended Mt. Washington, on the carriage road, to just beyond the five mile post. Below the Half-way House a short distance, the first *Argynnis montinus* was seen. A little farther on the road they were fairly abundant, one appearing on the wing every few minutes. They settled to feed on the flowers of *Solidago virgaurea* Linn., a very pretty little species of goldenrod, and while so occupied, could be caught, if approached carefully. Some specimens settled in the road, but I did not see any on flowers other than the one mentioned. The specimens were all fresh and in fine condition. Dr. Scudder gives July 12th as the earliest date of their appearance and the latest as September 15th. Some years ago I caught a number of specimens on August 20th at the same locality, but they were not in as fine condition. It is likely that they do not appear before the month of July. Their life history is unknown and to elucidate it some days should be spent on the mountain. I caught a number of females of the species, but was not fortunate enough to find one ovipositing. It is not unlikely that the female drops her eggs over the food plant as is the habit in some other species of the genus. The collector would probably always find the species on clear days during the time of its appearance. In the afternoon, when the east side of the mountain was in the shadow, I did not see any of the butterflies.

*Plusia u-aureum* Guen. was quite abundant on the goldenrod and in perfect condition. One female of *Chionobas semidea* was taken just above the five mile post. This is probably a low altitude for it on the mountain. This particular day was wonderfully clear and the views superb, and it was a great pleasure to have good collecting and an interesting tramp up the big hill.—HENRY SKINNER.

*Mr. A. N. Caudell has kindly permitted me to make a study of specimens of Zoraptera (whose line of descent branches off near the base of the Isopteron line), and an examination of this material would indicate that the fairly even balance of characters in the Grylloblattids between the superorders Panisoptera and Panplecoptera is made to swing slightly nearer the Zoraptera and other Panisoptera, thus swinging the base of the line of development of the Grylloblattids slightly toward the side of the Zoraptera (with the Isoptera and Mantidae), although the Grylloblattids are also very close to the Embiids and Dermaptera. It is very probable that the genitalia of male Grylloblattids will be found to resemble those of the Zoraptera remarkably closely.

# ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., FEBUARY, 1919.

**Entomology at the Convocation Week Meetings.**

When arrangements were first made in the Autumn of 1918 for the meetings of the American Association for the Advancement of Science and Affiliated Societies at Baltimore, December 23 to 28, 1918, wartime conditions were such as to lead to positive discouragement of any large attendance. With the signing of the armistice, an increased interest was manifested and several societies, which had decided to hold no sessions, arranged scientific programs. Nevertheless the annual program of the seventy-first meeting of the A. A. A. S. and of the meetings of other societies is a slim pamphlet of but forty-four pages in comparison with those of recent years. The number of papers, which can be called entomological in any sense, listed therein is but 64, and is much smaller than for many years. Fifty-two of these appear on the program of the American Association of Economic Entomologists, including the Apicultural and Horticultural Inspection Sections, 6 on the joint program of Section F, Zoology, of the A. A. A. S., and the American Society of Zoologists, 2 each on those of the American Society of Naturalists and of the Ecological Society of America, 1 each on those of Section I, Social and Economic Science, A. A. A. S., and the School Garden Association.

The presidential address before the Economic Entomologists, by Dr. E. D. Ball, was on "Economic Entomology,—Its Foundation and Future." Prof. Herbert Osborn, as retiring Vice-President of Section F, spoke on "Zoological Aims and Values." Dr. L. O. Howard gave a paper at the confer-

ence between Government and Laboratory Zoologists arranged for the same section, and Prof. J. G. Needham led the discussion following. Dr. Howard also spoke on "Economic Entomology and the War" before Section I. The two papers with entomological bearing given before the Ecological Society were by H. C. Oberholser, "Ecological Investigations under the Federal Government" and V. E. Shelford, "Suggestions as to the Climograph of Deciduous Forest Invertebrates, as illustrated by Experimental Data on the Codling Moth." Not included in the numbers given above were the papers presented to the Optical Society of America on various optical apparatus, of interest to entomologists.

Smokers for biologists, and dinners for the Naturalists and Ecologists were held as usual.

## Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**2**—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, London, Can. **5**—Psyche, Cambridge, Mass. **7**—Annals of the Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **16**—The Lepidopterist, Salem, Mass. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Ento-

mologique de France, Paris. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **54**—Proceedings of the Biological Society of Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **62**—Bulletin of the American Museum of Natural History, New York. **63**—Memorias de la Sociedad Cubana de Historia Natural "Felipe Poey," Habana. **64**—Parasitology, London. **65**—Archives des Sciences Physiques et Naturelles, Geneve. **66**—Records of the Indian Museum, Calcutta. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Lancaster, Pa. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **71**—Novitates Zoologicae, Tring, England. **72**—The Annals of Applied Biology, London. **73**—Proceedings of the Linnean Society of New South Wales, Sydney. **74**—Proceedings of the Staten Island Institute of Arts and Sciences, New York. **75**—The Anatomical Record, Philadelphia. **76**—Nature, London.

**GENERAL. Bentley, G. M.**—Benefits to be derived from observing, collecting and studying insects (Tennessee State Board of Entomology, Knoxville. Bull. No. 20). **Cardin, P. G.**—Notas entomologicas. **63,** iii, 53-61. **F. A. D.**—Nursing habits of ants and termites. **76,** cii, 308-9. **Ellsworth, A.**—The vastness of insect life. **17,** ii, 92-4. **Knab, F.**—Obituary. **12,** xi, 484-5. **Mann, W. M.**—Myrmecophilous insects from Cuba. **5,** xxv, 104-6. **Swett & Cassino**—The White Mountains of New Hampshire. **16,** ii, 90-6 (cont.). **Woodward, C. W.**—The pronunciation of insect names. **19,** xiii, 122-3.

**GENETICS. Nakahara, W.**—Some observations on the growing oocytes of the stonefly, Perla immarginata, with special regard to the origin and function of the nucleolar structures. **75,** xv, 203-15.

**MEDICAL. King, W. V.**—Memorandum on a case of dermal myiasis caused by Lucilia sericata. (New Orleans Med. & Surg. Journal, lxxi, 106-8.).

**ARACHNIDA AND MYRIAPODA. Brethes, J.**—Nephila riverai, nouvelle araignee argentine. **20,** 1918, 216-18.

**Chamberlin, R. V.**—Myriopods from Okefenokee Swamp, Ga., and from Natchitoches Parish, La. [10 new]. **7,** xi, 369-80. New spiroboloid diplopods [7 n. sps.]. **54,** xxxi, 165-70.

**NEUROPTERA. Banks, N.**—Termites of Panama and British Guiana. **62,** xxxviii, 659-67. **Dobson, R. J.**—A European termite, Reticulotermes lucifugus, in the vicinity of Boston. **5,** xxv, 99-101. **Howe, R. H.**—Distributional notes on New England Odonata. II.

**5,** xxv, 106-10. **Kennedy, C. H.**—The varieties of the dragonfly, Agrion aequabile. **4,** 1918, 406-11. **Peacock, A. D.**—The structure of the mouthparts and mechanism of feeding in Pediculus humanus. **64,** xi, 98-117. **Stohr, R. P.**—Odonates des environs de Saint Alexandre, Ironside, P. Q. **67,** xiv, 81-5. **Tillyard, R. J.**—The structure of the cubitus in the wings of the [Australian] Myrmeleontidae. **73,** xliii, 116-22. **Whedon, A. D.**—The comparative morphology and possible adaptations of the abdomen in the Odonata. **2,** xliv, 373-437.

**ORTHOPTERA. Chopard, L.**—Apropos des Cylindrachaeta, genre de gryllides endophyte [S. Am.]. **20,** 1918, 213-16. **Crampton, G. C.**—The thoracic sclerites of the grasshopper Dissosteira carolina. **7,** xi, 347-68. **Dusham, E. H.**—The wax glands of the cockroach (Blatta germanica). **70,** xxxi, 563-81.

**HEMIPTERA. Ball, E. D.**—The phlepsids of Mexico and Cent. Am. (Cicadellinae). **7,** xi, 381-92. **Becker, G. G.**—Empoasca mali attacks man. **5,** xxv, 101. **Fracker, S. B.**—The Alydinae of the U. S. **7,** xi, 255-82. **Green, E. E.**—A list of Coccidae affecting various genera of plants. **72,** v, 143-56. **Olsen, C. E.**—Notes on some Cicadellinae in the U. S. Nat. Museum. **19,** xiii, 119-21. **Parshley, H. M.**—Three sps. of Anasa injurious in the north. **12,** xi, 471-2. **Taylor, L. H.**—The thoracic sclerites of Hemiptera and Heteroptera. **7,** xi, 225-54. **Weiss & Dickerson**—The life-history and early stages of Corythucha parshleyi. **4,** 1918, 401-6. **Weiss & Nicolay**—The life history and early stages of Calophya nigripennis. **12,** xi, 467-70.

---

**Knight, H. H.**—Interesting n. sps. of Miridae . . . with a note on Orthocephalus mutabilis [7 new]. **19,** xiii, 111-16. **Van Duzee, E. P.**—New species of H., chiefly from California [many new]. **61,** viii, 271-308.

**LEPIDOPTERA. Bonniwell, J. G.**—Arachnis zuni. **16,** ii, 85. **Davidson, W. M.**—The California pistol-case bearer (Coleophora sacramenta). **12,** xi, 446-53. **Hampson, G. F.**—Some small families of the L. which are not included in the key to the families in the catalogue of Lepidoptera Phalaenae. **71,** xxv, 366-94. **Mosher, E.**—Pupae of common Sphingidae of eastern No. Am. **7,** xi, 403-42. **Pictet, A.**—Sur l'origine du dimorphisme sexuel de coloration chez les lepidopteres. Intervention de l'elevation de la temperature pour provoquer l'eclosion des papillons. **65,** xlvi, Suppl. 17-22, 32-34. **Prout, L. B.**—A provisional arrangement of the Dioptidae. **71,** xxv, 395-429. **Reiff, W.**—Colias philodice, f. nigrofasciata. **17,** ii, 90-1. **Swett, L. W.**—A new geometrid. **16,** ii, 82-4.

**Cassino, S. E.**—A new form of Cataloca [Catocala] blandula. Catocala faustina f. rubra. **16,** ii, 81-2; 84-5. **Grinnell, F.**—Some variations in the genus Vanessa [3 new]. **5,** xxv, 110-15.

**DIPTERA. Cameron, A. E.**—The oviposition habit of Gastrophilus nasalis. **68,** xlix, 26. **Davis, W. T.**—The Tabanidae of Staten Island, N. Y. **74,** vi, 201-3. **Johnson, C. W.**—Notes on the species of the genus Dioctria. **5,** xxv, 102-3. **Morris, H. M.**—The larval and pupal stages of Scatopse notata. **72,** v, 102-111. **Prashad, B.**—Larval and pupal stages of an Indian Chaoborus and Dixa. **66,** xv, 153-8. **Roubaud, E.**—Rythmes physiologiques et vol spontane chez l'Anopheles maculipennis. **69,** 1918, 967-9. **Royer, M.**—Note sur la ponte d'Anopheles maculipennis. **20,** 1918, 211-13.

---

**Aldrich, J. M.**—The kelp-flies of N. Am. (Fucellia, Anthomyiidae), [4 new]. **61,** viii, 157-179. **Malloch, J. R.**—Three new North Am. Chloropidae. **19,** xiii, 108-11. **Petley, F. W.**—A revision of the genus Sciara of the family Mycetophilidae [2: 28]. **7,** xi, 319-46.

**COLEOPTERA. Davis, A. C.**—Notes on Pleocoma (II). **19,** xiii, 116-18. **Denier, P.**—Sur le genre Picnoseus (Meloidae) [S. Am.]. **20,** 1918, 208-10. **Kraatz, W. C.**—Scirtes tibialis, with observations on its life history (Dascylidae). **7,** xi, 393-402. **Leng, C. W.**—Some beetles of a Staten Island garden. **74,** vi, 204-9. **Woods, W. C.**—The alimentary canal of the larva of Altica bimarginata. **7,** xi, 283-318.

---

**Blatchley, W. S.**—Some new or scarce C. from western and southern Florida [3 new]. **4,** 1918, 416-24. **Wolcott, A. B.**—Notes on Cleridae [2 n. gen.]. **19,** xiii, 107-8.

**HYMENOPTERA. Buchner, P.**—Vergleichende eistudien I. Die akzessorischen kerne des hymenoptereneies. **51,** xci, Abt. 2, 1-202. **Cockerell, T. D. A.**—Descriptions and records of bees [Mex.]. **11,** ii, 476-82. Bees from British Guiana. **62,** xxxviii, 685-90. **Howard, L. O.**—Two new instances of polyembryony among the Encyrtidae. **68,** xlix, 43-4.

---

**Beutenmuller, W.**—Two new Cynipidae. **19,** xiii, 118-19. **Bradley, J. C.**—Descriptions [of 3 new sps.] and records of some interesting parasitic H. mostly collected . . . in Tompkins County, N. Y. **19,** xiii, 98-106. **Cockerell, T. D. A.**—Some halictine bees [2 new]. **9,** 1918, 261-2.

---

A COLLECTOR'S MANUAL IN SPANISH.—That very energetic worker, Prof. Carlos E. Porter, Director of the Museum and Laboratory of Applied Zoology, etc., at Santiago, Chile, has recently published a

compact, comprehensive and well illustrated manual entitled "Breves Instrucciones para la Recolección, Conservación y Envío de Ejemplares de Historia Natural Para los Museos." In this manual he includes illustrations and instructions covering virtually the whole animal kingdom, and adds seven pages on botany and nine on geology. The portion on Entomology is full and well illustrated. This is evidently a third edition of this useful book, the previous editions having been published in 1901 and 1903.

We have nothing just like this in English, although the U. S. National Museum has published several pamphlets giving directions for collecting and preserving different groups. The bringing of all this material together might be advisable, since many people could use such a work. Evidently Professor Porter has found that his manual is of value in South America, as is shown by the necessity for publishing three editions.—L. O. Howard, Washington, D. C.

---

Injurious Insects and Useful Birds. Successful Control of Farm Pests. By F. L. Washburn, M.A., Prof. of Entomology, Univ. of Minn.; Entomologist to the Minn. Exper. Station, and State Entomologist; Fellow of A. A. A. S., Member Amer. Assoc. Econ. Ent.; Ent. Soc. Amer., Am. Soc. Naturalists, etc. 414 illustrations in text and four colored plates. J. B. Lippincott Company, Philadelphia and London.—Prof. Washburn states that the suggestions in his book are largely the results of twenty-one years of work in Economic Entomology. The book is intended for the use of high schools, agricultural colleges, farmers, orchardists, vegetable growers, owners of gardens and housekeepers. The questions at the ends of chapters are useful, and in addition to the usual chapters on insects injurious to vegetation there are chapters on insects affecting man and the household; insects and insect-like animals attacking stock and poultry. A very valuable feature is the chapter on the relations of birds to agriculture, which is illustrated by the useful birds. The work closes with the chapter on some of the four-footed pests of the farm. This is an all-round good book and we can heartily recommend it.—Henry Skinner.

---

Wasp Studies Afield. By Phil Rau and Nellie Rau, with an Introduction by William M. Wheeler. Princeton University Press. 1918. Price $2.00.

We take pleasure in helping to introduce this mightily interesting book. The authors are well known to students of animal behavior for their accuracy in depicting the life and ways of insects. The fact that Prof. Wheeler gives the introduction vouches for the scientific importance of the work. The subject, with one or two exceptions, is the

habits of the wasps that build their nests in burrows. How they go about this, how they provide food for their young, how they find their well-concealed nest again, are all described in the most interesting manner. Marvelous instances of place memory, displays of instinct, are mentioned, also ingenious experiments are made on the homing of the common paper-nest wasp. The book is the result of four years' out-of-door study, generally within a radius of thirty miles of St. Louis, of these wasps "in their natural haunts while pursuing their occupations in their own ways." One of the most interesting chapters is that on "Some Bembicine Wasps," in which are described the nesting and social habits of the western burrowing wasp, *Bembix nubilipennis*. The peculiar nuptial or sun dance is vividly pictured in words. A colony of these wasps nested year after year in a bald and bare space in a field which the boys of the neighborhood kept packed hard in pursuit of their weekly baseball game. Even though suddenly interrupted in their sun dance or nest building, the wasps returned at the first opportunity. How the mother attends the nest and her young until its maturity, and other minute details in the habits of this wasp are mentioned, showing close and patient observation. The chapter on pompilid wasps, especially as regards *Pompiloides tropicus*, is scarcely less interesting. Here are described the peculiar methods of carrying the prey, erratic actions during excavation of the burrows, and the constant guard against parasites. The patience of the observers is somewhat realized when reading this chapter, especially that part relating to the tantalizing actions of *Priocnemis pompilius*. Other chapters describing the habits of some fly-catching wasps, bee-killing wasps, the muddaubers which build their mud nests in the gables and on the rafters of our buildings, wood-boring wasps, the sand-loving ammophila, and the mining eumenid wasps, are all of absorbing interest. The nesting habits of the hunters of Orthoptera in the genera *Alyson, Tachysphex,* and particularly *Priononyx atratum* and *thomae,* are minutely described. Here is told how the cow-bird wasp, *Stizus unicinctus,* watches *thomae* make and supply her nest and, when it is sealed and camouflaged, burrows down, destroys *thomae's* egg and lays her own. In the last chapter, on general considerations, the authors comment on the evidences deduced from their observations. They state that "the data secured give evidence of four very definite attitudes [types?] of behavior: 1. That there are very definite and iron-clad instincts. 2. That, despite these instincts, which are constant in each species, there is much variation in the behavior of the individuals. 3. That there is a display of the expression of emotions in these creatures. 4. That, in many instances, there is much aptitude for learning, display of memory, profiting by experience and what seems to us rational conduct."—E. T. Cresson, Jr.

# Doings of Societies.

## Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting of September 26th, 1918, Director Philip Laurent presiding; eleven persons present.

**Orthoptera.**—Mr. Rehn made a few remarks on the discovery of a new Asiatic species of a hitherto exclusively North American genus of Decticinae (Tettigoniidae), the comments illustrated by a series of all the known species of the genus.

**Lepidoptera.**—Dr. Skinner reported that he secured a good collection of *Argynnis montinus* in the White Mountains this summer. Mr. Baylis exhibited a specimen of *Catocala herodias*, captured at Lakehurst, New Jersey, this summer, also several specimens of *Chlorippe clyton* bred from larvae taken along the Perkiomen Creek near Philadelphia.—E. T. CRESSON, JR., *Recorder*.

---

## American Entomological Society.

Meeting of April 25, 1918, in the hall of the Academy of Natural Sciences of Philadelphia. Twelve persons present including Dr. Edwin C. Van Dyke, of the Pacific Coast Entomological Society, visitor. Dr. Henry Skinner presided.

**Coleoptera.**—Dr. Van Dyke made an interesting communication on the general character, habits, distribution, relationship and taxonomic history of the family Elateridae. He discussed and described some of the characters upon which present students are basing their classification in correlation with larval characters, showing some of the faults of the older system. He called attention to specialized characters of protection and adaptation, also to others which show an affinity to, or parallelism with, the Lampyridae. He then took up some of the more important genera, giving general characteristics and distribution, leading into more detailed discussions of those of North America. He divided our fauna into genera of northern, southern, and of isolated origins, and explained the reason for the relationships of some widely separated species. The family is considered very primitive, which, to some extent, accounts for their similarity in general habitus. The work of Schwarz in the *Genera Insectorum* was severely criticized as not being of the constructive character as that of Leconte, Horn and Candeze. He commended the work of Hyslop in his investigations into the characters of the larvae. The speaker made special mention of the genus *Cardiophorus* and discussed in some details some of its peculiar characters. In answer to questions arising in the discussion following his communication, Dr. Van Dyke took up in more detail the origin and general distribution of the coleoptera

of North America, especially in regard to the Glacial, Ozarkan and Sonoran zones of dispersal.

Mr. Rehn spoke of similar zonal dispersion in some orthopteran genera.

Dr. Calvert brought up the question as to the origin and relationships of the Elateridae and Lampyridae, to which Dr. Van Dyke replied that they were evidently very close; probably of the same origin with more or less parallelism in their development of certain characters. Both families are considered by most authors as being of the most primitive of the coleoptera.

Mr. Rehn illustrated the error in considering species as widely spread over certain areas while, in fact, if more detailed collecting was done and more detailed data given as to locality, altitude, and environment, it would be found that such species are more or less restricted, with distribution following only a well-defined, connected life zone.

---

Meeting of June 10, 1918, in the same hall, Dr. Henry Skinner, President, in the chair. Sixteen persons present including Messrs. Passell and Kline, visitors.

The custodian announced the following donations to the collection: two specimens *Tabanus fusco-punctatus* from Florida, from G. M. Greene; twenty species Crane flies and larvae in alcohol, from C. P. Alexander; 300 microscopic slides of the male genitalia of the genus *Lycaena* (Lepidoptera) and the insects from which the segments were taken, from R. C. Williams, Jr.

**Orthoptera.**—Mr. Rehn exhibited the series of the Acridid genus *Mermiria* from the Hebard collection, all the known forms being represented by large series. The speaker also made some comments on the relationship and distribution of the species, followed by discussion on the distribution of insects in general by Messrs. Calvert, Skinner and Williams.

**Coleoptera.**—Mr. Laurent exhibited specimens of *Hylotrupes bajulus* Lec., and the destructive work the larvae had done in a pine board. The speaker cited a case at Anglesea, New Jersey, where the larvae of this beetle had honeycombed the yellow pine flooring of a house to such an extent that it was necessary to lay an entire new floor.

**Lepidoptera.**—Dr. Skinner reported *Alypia octomaculata* as abundant here this year and swarming in New York.

The following were elected to membership: Messrs. Arthur H. Napier, Geo. M. Greene and J. Wagener Green.—R. C. WILLIAMS, JR., *Recording Secretary.*

**Feldman Collecting Social.**

Meeting of September 18th, 1918, at the home of H. W. Wenzel, 5614. Stewart Street, Philadelphia; ten members present. President H. W. Wenzel in the chair.

**Lepidoptera.**—Mr. Haimbach mentioned *Eucosma adamantana* Gn., a species described from Lapland and never seen again from that time until rediscovered by Mr. Daecke in New Jersey sixty years later. Said he had gone to Lucaston on September 12 and, though it was the proper time and he worked over the ground for six hours, he was unable to get a single specimen. Also said he has bred thousands of *Callosamia promethea* Dru. and this year was about to liberate several specimens when he noticed an odd form which proved to be the aberration *caeca* described from a unique female from New York by Cockerell in Packard's Monograph of the Bombycine Moths of North America III, p. 228, 1914, and the type presented to the United States National Museum.

**Coleoptera.**—Dr. Castle said his annual trip to Maryland was a complete failure though he had gone a week later than usual. All species which were generally common were not found at all. Exhibited specimens of *Popillia japonica* Newm., the Japanese pest, which he had gotten at Riverton, New Jersey, IX-I, saying they will eat anything, that boys are paid to gather them and bring them in by the quart.

**Diptera.**—Mr. Hornig recorded a species of mosquito, as new to this vicinity, *Aedes curriei* Coquillett, from the northwest, and found here under the same conditions and in the same place with the swamp mosquito.—GEO. M. GREENE. *Sec'y.*

## OBITUARY.

VICTOR ARTHUR ERICH DAECKE.

In the NEWS for December last we briefly announced the death of our fellow member of the Advisory Committee at Richmond Hill, Long Island, New York, on October 28, 1918. Thanks to the kindness of his sister, Mrs. Jenny Schwensen, of that town, we are able to give some data on his early life.

E. Daecke, as his autograph appears on letters of the past year, was born at Scharnikan, in the province of Posen, Germany, March 28, 1863, and was the son of Julius and Augusta Daecke. Most of his early years were spent in Bromberg, Germany, where he attended the Gymnasium and the Real

Gymnasium. From his early childhood he was a serious lover of nature and of art, the latter interest influenced, no doubt, by a visit through Italy, as a youth.

He came to the United States in 1881 and lived at Montclair, New Jersey, Richmond Hill and New York City, before coming to Philadelphia about 1900. He applied his artistic ability in various lines, being at one time artist with the United States Printing Company, at Brooklyn, and at the time of our first acquaintance with him was connected with the Philadelphia *Press* as an illustrator. He soon became known to the Philadelphia entomologists and apparently the first record of his speaking at the Feldman Collecting Social is that given in the NEWS for December, 1900, (page 642). At the October meeting of that year, he gave the results of some collecting at Castle Rock, Pennsylvania, and Manumuskin, New Jersey. He was nominated for membership on the same evening, his residence being given as 1709 Chestnut Street, and elected at the following November meeting. On November 22, 1900, he became an Associate of the Entomological Section of the Academy of Natural Sciences of Philadelphia, and thereafter scarcely a volume of the NEWS does not contain, under the heading of "Doings of Societies," some records of his collecting activities in New Jersey or Pennsylvania.

In 1907-08 he suffered from a long illness, but after his recovery removed to Harrisburg to become an assistant in the Pennsylvania State Department of Zoology, under Professors H. A. Surface and J. G. Sanders, a position which he held until his death. On October 27, 1910, he was elected a member of the Advisory Committee of the NEWS.

He was a charter member of the Entomological Society of America and a member of the American Association for the Advancement of Science since 1907-08. He became a member of the New York Entomological Society previous to his removal to Philadelphia and in 1895 was Chairman of its Publication Committee.

Mr. Daecke was a most enthusiastic and careful collector, devoting himself to the local fauna wherever he might be. He gathered insects of all orders and paid much attention to

their early stages, life histories and habits. In the early years at Philadelphia he did much with the Odonata, as a paper in the NEWS for January, 1903, indicates, a notable discovery of his in this order being that of *Telagrion? daeckii* at Manumuskin; nor did he ever neglect them, as a note in our issue for last July (page 278) evidences. Later the Tabanidae especially attracted his energies and he prepared the list of species of this family for the 1909 report on the Insects of New Jersey. In this report, Prof. John B. Smith wrote of him: "An excellent general collector whose expeditions into South Jersey have produced a large number of most useful records in almost all orders." Many of his associates are indebted to him for valuable material and he unquestionably did much in the way of accumulating positive data on geographical distribution. The writer especially will greatly miss his kindly aid extending over nearly twenty years.

His nephew, Mr. Erich E. Lehsten, of New York City, writes of him: "Mr. Daecke was always exceedingly self-contained; very rarely discussing his private affairs with anyone; doing all the good he could; giving those with whom he came in contact every assistance in his power, and, to the best of my knowledge, has never injured anyone." He never married, but was a great lover of children.

He contributed the following papers to the NEWS. To bring together his collecting records contained in volumes XI-XXIX is a task of some considerable extent which, we believe, has not been attempted.

Notes on *Prionapteryx nebulifera* Steph. Vol. XVI, pp. 12-14, pl. ii and text figure. January, 1905. [Lepid.]

Two new species of Diptera from New Jersey, *t. c.* pp. 249-251, text figs. October, 1905. [*Chrysops bistellatus, amazon.*]

On the Eye-Coloration of the Genus *Chrysops*. Vol. XVII, pp. 39-42, pl. i. Feb., 1906. [Dipt.]

*Mydas fulvifrons*. Illiger. *t. c.*, p. 347. Nov., 1906. [Dipt.]

Annotated List of the Species of *Chrysops* occurring in New Jersey, and Descriptions of two New Species. Vol. XVIII, pp. 139-146, pl. vi, text figures April, 1907. [*C. parvulus* and *hinei* new.]

Trypetid Galls and *Eurosta elsa* n. sp. Vol. XXI, pp. 341-343, pl. x. Oct., 1910. [Dipt.; the new species named for his niece, Elsa Schwensen].

PHILIP P. CALVERT.

# EXCHANGES.

**This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.**

☞ **These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.**

**Wanted**—A series of volumes of the Candian Entomologist including vols. 29, 30 and 31; also Ontario Entomological Society Reports, Nos. 2, 3, 4, 8 and 9. State condition and price wanted. M. H. Ruhmann, Vernon, British Columbia.

**Wanted**—Canadian Entomologist. Part xx of H. F. Wickham's Coleoptera of Canada or complete number of Can. Ent., xxix, Feb., 1897, containing same. Also Farmers' Bulletins 189 and 191. Geo. M. Greene, 2534 W. Columbia Ave., Philadelphia, Pa.

**Catocalae**—For exchange; perfect specimens of *Faustina* var. *zillah, similis, gracilis.* Desire other *Catocalae.*—Ernest Baylis, 5011 Saul Street, Phila., Pa.

**Incisalia polios for Exchange**—Want *I. irus, augustus, niphon, T. damon* and *Thecla* from South and West. Also have *L. pontiac* to exchange for "Skippers." H. M. Bower, 702 First National Bank Bldg., Milwaukee, Wis.

**Wanted to Exchange**—I wish to exchange Actias luna cocoons for Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

**Will pay cash** for Pars 39 and 52: Coleopterorum Catalogus, of Junk. Jos. O. Beaulne, 3653 Notre Dame East. Montreal. Canada.

**Wanted**—Living and preserved material of Tabanid and other dipterous larvae and pupae. Tabanid larvae obtained by sifting soil at edge of ponds and streams. Packing in wet material, not water, each larva separate, in glass vials or tins. To preserve use boiling water, then alcohol. Exchange: Insects of all orders, or cash. Werner Marchand, 10 Dickinson St., Princeton, N. J.

**Live Pupae** of Sph. chersis, drupiferarum, luscitiosa, eremitus, Phil. achemon, Deid. inscripta, Paon. excaecatus, myops, Eac. imperialis, Cres. juglandis and others for exchange. Wanted—N. A. and Exotic Lepidoptera. Will pay cash for N. A. Catocalas. Herman J. Erb, 925 Hatch Ave., Woodhaven, Lg. Isl., New York.

**Wanted for Cash or Exchange**—Exotic Lycaenidae and some species from the U. S. Send me your offerta and lowest cash price. Paul N. Musgrave, 130 Oak Street, Clarksburg, W. Va.

**Wanted**—Syrphidae, Bombylidae and Coccinellidae from all parts of the world in exchange; also Florida insects for those from other regions. P. W. Fattig, Box 315, Gainesville, Fla.

**Wanted**—Phanaeus, Moneilema and Cleridae for cash or liberal exchange in rarities. Please send your lists to F. J. Psota, 316 So. Mozart St., Chicago.

**Diurnal Lepidoptera**—I have many desirable western species to exchange. Send lists of offerta. Dr. John Comstock, Southwest Museum, Marmion Way and Ave. 46, Los Angeles, Calif.

**Certain Odonata Wanted.**—The undersigned desires to examine Gomphus dilatatus and Enallagma pollutum from Florida and nearby States and will much appreciate a loan of such specimens. Please write before sending.—Philip P. Calvert, Zoological Lab'y., University of Pa., Philadelphia, Pa.

**Wanted**—Species of Dytiscidae, Haliplidae, Gyrinidae and Hydrophilidae, either for exchange or cash. Please send lists. Dr. Geo. W. Bock, 2904 Allen Ave., St. Louis, Mo.

# RECENT LITERATURE

FOR SALE BY

## THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE ST., PHILADELPHIA, PA.

### COLEOPTERA.

2106.—**Blaisdell** (F. E.)—Studies in the Tenebrionid tribe Eleodiini. No. 4 [7 new]. (Ent. News, **29**, 380-387, 1918) .15

### DIPTERA.

2108.—**Malloch** (J. R.).—On an undescribed species of Medeterus. (Ent. News, **30**, 7-9, 1919) ..... .10

### HEMIPTERA.

2107.—**Wilson** (H. F.).—Three new Lachnids, with comparative notes on three others. (Ent. News, **30**, 1-7, 2 pls., 1919) ..... .20

### HYMENOPTERA.

2110.—**Cockerell** (T. D. A.).—A new genus of bees from Peru. (Ent. News, **30**, 17-18, 1919) ..... .10

### LEPIDOPTERA.

2109.—**Schwarz** (E.).—On the early stages of Catocala titania, and a description of three new varieties of Catocala. (Ent. News, **30**, 14-17, 1919) ..... .10

### ODONATA.

784.—**Whedon** (A. D.).—The comparative morphology and possible adaptation of the abdomen in the Odonata. (Trans. **44**, 374-437, 9 pls., 1918) ..... 1.20

### ORTHOPTERA.

783.—**Rehn** (J. A. G.).—Descriptions of one new genus and fifteen new species of tropical American Orthoptera. (Trans., **44**, 321-372, 2 pls., 1918) ..... .85

---

## SALE. EXCHANGE.

Exotic Lepidoptera. Morphos, Papilios, Caligo, Saturnidae, Nymphalidae, etc. Rare bargains in lots. Send for prices. 4 Morphos, 1 Caligo , 2 Opsiphanes, 7 Papilios, 6 Prepone for $2.50.

**G. G. MacBEAN, Assiniboia, Sask.**

---

## SOLD

I have sold my 1918 stock of Catocala ova to Mr. T. D. Mayfield, 50 Columbia Street, Newark, New Jersey.

TOM SPAULDING,
R. F. D. No. 1. Box 274, Provo, Utah.

# List of Coleoptera of North America

**BY CHARLES W. LENG**

---

A complete list of described species, varieties, subspecies, and synonyms, with page reference to work in which each was originally described, and general distribution of each.

Also a complete list of all works containing original descriptions of North American species from 1758 to the end of 1918, and complete list of the fossil species of North America by Professor H. F. Wickham.

Price, unbound, including delivery, $5.50; printed on one side only, $7.00.

Payment in advance is requested to assist in financing publication. It will be necessary to advance the price upon publication.

---

Less than 200 subscriptions have so far been received. There should be 500 in hand before publication.

Please send your subscription at once to the publisher.

---


JOHN D. SHERMAN, JR.

24 CLAREMONT AVENUE

MOUNT VERNON, NEW YORK

# NEW ARRIVALS

**From Columbia, So. America:**

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

**From Cuba:**

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

**From Venezuela:**

Over 5000 Lepidoptera
200 Dynastes hercules

**From New Guinea:**

2000 Coleoptera
200 Orthoptera

**From Assam, India:**

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

**From Tibet (Bhutan)**

Armandia lidderdalii
Parnassius hardwicki

---

**CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION**

---

If interested kindly send your list of desiderata for further information to

**THE KNY-SCHEERER CORPORATION**

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street